explanation usually given [1] of this phenomenon is that it is due to the refraction of the sun's rays passing through their atmospheres, and thus illuminating rather more than one hemisphere at a time. Any small body surrounded by a ring of light would naturally appear darker by contrast than the surrounding background.

In regard to photographing the moon in the daytime, it may be as well to call attention first to the fact, that as the moon and sky are nearly of the same brilliancy, and there are accordingly no irradiation effects, it is not a question of the best form of apparatus, but almost entirely of the contrast qualities of the plate and developer employed. In fact an ordinary camera furnished with a long focussed landscape lens is as good an instrument as can be devised for this investigation. Fortunately I had on hand some of Edwards's bromide plates, imported last June, and they, together with some Carbutt B. and Anthony chloride plates, were employed in the following determinations.

It should also be stated in regard to my remark, reading "the impossibility of photographing the moon in the daytime, when the sun is high above the horizon," that this was merely a general statement, founded on observations made in June and July when the sun's altitude in the middle of the day was between 60° and 70°.

Dr. Huggins has now shown that this statement is not rigidly exact, as with the sun at an altitude of 35°, and the moon in the most favorable position at this season (the third quarter), he has obtained a distinct image upon his plates. I repeated his experiment, October 16 and 17, when the moon was in the first quarter, and with the sun at an altitude of 18° obtained a similar result. The images, though distinct, were far too faint to print, and only two plates out of nine showed any image at all, although the moon was very conspicuous to the eye. I should consider it doubtful if photographs of the moon could be obtained with the sun at an altitude of over 60°. If then there is difficulty in obtaining an impression of the moon at 90° distance from the sun, how much more difficult would it be to photograph the still fainter coronal rays, when masked by the dazzling brilliancy of our atmosphere in the sun's immediate neighborhood.

But what particularly interested me in Dr. Huggins's communication was, that I saw at once that it furnished me a new constant, and accordingly a new method, for determining the relative light of the atmosphere near the sun, and the corona. Five separate measurements were made between 1.15 and 4.15 on October 16 and 17, of the relative light of the sky in the immediate vicinity of the sun and moon, by the photographic method described in a previous paper.[2] These ratios varied from 16, when the sun was highest, to 50 at the later hour. Taking the average of these values, we may safely assume that between three and four o'clock, when my successful pictures of the moon were taken, the light about the sun is generally not far from 35 times as bright as the light of the sky in a region where it is just possible to photograph the moon. But according to the observation of Prof. S. P. Langley, previously quoted, the light of the moon is ten times that of the corona at 3′ distance from the sun. Accordingly the light of the atmosphere in the immediate vicinity of the sun would have to be reduced 350 times in order to obtain an impression of the corona upon our plates. If the sun were at a greater altitude, this figure would be somewhat smaller. The value found by my previous experiments was 320. The closeness of the coincidence is probably accidental, but of the two methods the first one seems to me rather the more accurate.

WM. H. PICKERING.

[1] Newcomb's Astronomy, p. 299. [2] *Science*, Aug. 14.

Voss-Holtz electrical machine.

In response to Mr. Eaton's communication in *Science*, No. 141, I would say that, about a year ago, I compiled for one of my classes a discussion of the Voss-Holtz electrical machine. Some months afterward Mr. E. B. Benjamin prepared a pamphlet regarding his machines, and asked my permission to incorporate what I had given my students regarding the theory of these. I granted his request, though not satisfied with the completeness of the discussion. What I had written had not been intended as a contribution to science, and I did not deem it of sufficient importance to quote authorities. Before putting my compilation on paper, I had consulted Ferguson, Silvanus Thompson, Ganot, Desehanel, some articles by Dr. Atkinson of Chicago, and the article in *Science* by Mr. H. W. Eaton. I cheerfully express my obligation to all of these writers. Mr. Eaton's article was specially helpful. As I claimed no originality, there was no attempt or wish to deprive him of any credit due.

The greater part of Mr. Benjamin's pamphlet was written by himself. W. LE C. STEVENS.

Brooklyn, Oct. 19.

Recent Proceedings of Societies.

Academy of natural sciences, Philadelphia.

Botanical section, Oct. 12.—Mr. Aubrey H. Smith described the flowering of Gordonia pubescens in Bartram's garden and gave a history of the species.—Mr. John Redfield spoke of the topographical features of Martha's vineyard and Nantucket, in connection with the flora of those islands. The northern part of the former rises into rounded gravelly hills of considerable elevation, composed of gravel drift, with occasional large bowlders. They are evidently of glacial origin. The more central portion consists of level plains of gravel covered with oak, mostly Quercus obtusiloba. The general character of the flora is much like that found on the summit of the divides in southern New Jersey, though much more limited as to species. Farther south, extensive ponds both of fresh and salt water introduce their characteristic vegetation. In Nantucket he had found the gravelly hills of much less height, the greater portion of the island consisting, in fact, of treeless plains. One extensive grove of Pinus rigida exists in the central portion, and is known to have been planted. The most characteristic plants of the plains seemed to be bear-berry, Arctostaphylos uva-ursi, which grows there in great profusion. The two species of Hudsonia abound, the Hericoides being seen everywhere, and less frequently the bluish tufts of H. tomentosa, Polygalae polygama, Myrica, cerifera, and various vaccinæ abound. He saw many large patches of Corema Conradii, the existence of which in Nantucket had first been made known by Mrs. Owen of Springfield, Mass. But the most inter-